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September 2015

# PREPOSITIONED STOCKS

Marine Corps Needs  
to Improve Cost  
Estimate Reliability  
and Oversight of  
Inventory Systems for  
Equipment in Norway

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# GAO Highlights

Highlights of [GAO-15-651](#), a report to the Committee on Armed Services, U.S. Senate

## Why GAO Did This Study

MCPP-N was established in 1981 as part of a DOD agreement to support the defense of Norway and global U.S. Marine Corps expeditionary operations. In 2012 the Marine Corps began transforming MCPP-N from an engineering and transportation capability to a Marine Air Ground Task Force capability, which includes combat vehicles and other tactical equipment, and it expects to complete the transformation in 2016.

Senate Report 113-176 included a provision that GAO review MCPP-N. This report determines the extent to which (1) MCPP-N addresses U.S. European and U.S. Africa command requirements; (2) reliable cost estimates exist to fund MCPP-N's sustainment of equipment to support a Marine Air Ground Task Force capability; and (3) the Marine Corps has quality assurance procedures in place to monitor the management of MCPP-N. GAO reviewed agency guidance and plans, analyzed budget estimates, and interviewed Marine Corps, Department of State, and Norwegian Defence officials.

## What GAO Recommends

GAO recommends that the Marine Corps (1) incorporate the four characteristics of reliable cost estimates in the forthcoming prepositioning programs budget development policy; and (2) develop, in consultation with the Norwegian Defence Logistics Organization, a means to conduct a quality assurance review of the Norwegian Equipment Information Management System. The Marine Corps concurred with the recommendations.

View [GAO-15-651](#). For more information, contact Cary Russell at (202) 512-5431 or [russellc@gao.gov](mailto:russellc@gao.gov).

September 2015

## PREPOSITIONED STOCKS

### Marine Corps Needs to Improve Cost Estimate Reliability and Oversight of Inventory Systems for Equipment in Norway

## What GAO Found

The Marine Corps is changing its mix of equipment at Marine Corps Prepositioning Program – Norway (MCPP-N) to address the U.S. European and U.S. Africa commands' strategic and theater-specific operational requirements. U.S. European Command's posture plan identifies MCPP-N as a key program that can respond to contingencies. While U.S. Africa Command plans that refer to a need to access prepositioned equipment do not specifically identify MCPP-N as an asset to meet that need, both Marine Corps and U.S. Africa Command officials stated that MCPP-N has served and can continue to serve as a global support asset to meet combatant command requirements. The Marine Corps reported that it routinely uses MCPP-N equipment sets to support European and Africa training and exercises.

Marine Corps cost estimates for sustaining the equipment to support a Marine Air Ground Task Force capability at MCPP-N may not be fully reliable, in that they do not fully meet the four general characteristics for reliable cost estimating—that is, being accurate, well-documented, credible, and comprehensive. For example, the Marine Corps documented its cost estimates, but the documentation did not include the source data used to develop the estimates or the calculations performed and estimating methodologies used. Marine Corps officials stated that they are drafting guidance for developing cost estimates for budget plans and plan to issue it in the fall of 2015, but this guidance will not address the four general characteristics for reliable cost estimating. Without ensuring that this guidance fully addresses those characteristics, the Marine Corps will not be positioned to know whether its budget proposals will meet the goal of sustaining equipment for a Marine Air Ground Task Force capability at MCPP-N.

The Marine Corps could improve its quality assurance procedures for monitoring MCPP-N. Specifically, the service relies upon the Norwegian Equipment Information Management System for data needed to manage its equipment inventory due to limitations in its own system, such as the lack of a warehousing application to effectively manage MCPP-N equipment. The reliance on two different information systems, one of which is owned and operated by a foreign government, creates several management challenges and risks to data reliability for the Marine Corps. For example, it results in a time lag in the accuracy of information in the Marine Corps system until it is manually updated with information from the Norwegian system—a time-consuming process that introduces a vulnerability to errors. The Marine Corps and the Norwegians have taken some steps to mitigate these risks for the interim until the Marine Corps system is capable of replacing the Norwegian system. Additionally, relying on the Norwegian system for management information makes the Marine Corps vulnerable to any weaknesses that may exist within the Norwegian system. However, the Marine Corps has not conducted a quality assurance review of the Norwegian system. Performing such a review would constitute a key step toward mitigating potential weaknesses in the Norwegian system.

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# Contents

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Letter		1
	Background	3
	MCCP-N Is Changing Its Equipment Mix to Address U.S. European Command and U.S. Africa Command Requirements	9
	Marine Corps' Cost Estimates for Funding MCCP-N's Equipment Sustainment May Not Be Fully Reliable	12
	Marine Corps Reliance on the Norwegian System Poses Management Challenges and Data Reliability Risks, and Quality Assurance Procedures Do Not Include a Review of the System	17
	Conclusions	25
	Recommendations for Executive Action	26
	Agency Comments and Our Evaluation	26
Appendix I	Scope, and Methodology	29
Appendix II	Comments from the Department of Defense	34
Appendix III	GAO Contact and Staff Acknowledgments	37
Related GAO Products		38
Tables		
	Table 1: Marine Corps and Navy <sup>a</sup> Annual Contributions to the Marine Corps Prepositioning Program – Norway for Fiscal Years 2010-2014	8
	Table 2: Organizations and Their Roles and Responsibilities in Managing the Marine Corps Prepositioning Program – Norway	9
	Table 3: Marine Corps Prepositioning Program - Norway Budget Estimates for Direct Costs for Operations and Maintenance for Fiscal Years 2015 to 2019 <sup>a</sup>	13
	Table 4: GAO's Assessment of the Marine Corps Prepositioning Program – Norway's Projected Budget for Fiscal Years	

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2015 – 2019 Based on the Four Characteristics of a Reliable Cost Estimate	14
Table 5: Department of Defense Locations Visited and Contacted	30
Table 6: Non-Department of Defense Organizations and Individuals Visited or Contacted	30

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## Figures

Figure 1: Locations of the Marine Corps Prepositioning Program – Norway Storage and Maintenance Facilities, 2014	4
Figure 2: Norwegian Constructed Pier in Hammernesodden, Norway, 2014	5
Figure 3: Equipment Offloading USNS Williams at Pier in Hammernesodden, Norway, 2014	6
Figure 4: HMMWVs at Frigard Cave, Norway, 2014	7

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## Abbreviations

DOD	Department of Defense
HMMWV	High Mobility Multipurpose Wheeled Vehicle
MCPP-N	Marine Corps Prepositioning Program – Norway

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September 17, 2015

The Honorable John McCain  
Chairman  
The Honorable Jack Reed  
Ranking Member  
Committee on Armed Services  
United States Senate

The Marine Corps Prepositioning Program - Norway (MCPN) was established in 1981 as part of the Department of Defense's (DOD) agreement to support the defense of Norway, as well as to support global U.S. Marine Corps expeditionary operations. In 2005, the United States and Norway renewed the memorandum of understanding that governs the prepositioning of MCPN equipment. MCPN is part of DOD's overall prepositioning program, whereby each of the military services prepositions stocks such as combat vehicles and repair parts worth billions of dollars at strategic locations around the world. Both afloat and ashore, prepositioning enables DOD to field combat-ready forces in days, rather than the weeks it would take if stocks had to be moved from the United States to the locations of conflicts. Since 1991, equipment stored in Norway as part of MCPN has been withdrawn and relocated within the geographic areas of either U.S. European Command or of U.S. Africa Command to support a variety of efforts, such as training and exercises, humanitarian assistance, disaster relief, and contingency operations. Since 2005 the Marine Corps has spent about \$117.6 million to support MCPN, which is its only land-based prepositioning program. Over the same period of time, the Norwegian Ministry of Defence has contributed approximately \$94.5 million in support of the program. Since 2012 the Marine Corps has been transforming MCPN from an engineering and transportation capability to a Marine Air Ground Task Force capability, which includes combat vehicles and other tactical equipment, to enhance

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its relevance to DOD's combatant commands.<sup>1</sup> The transformation is expected to be completed in fiscal year 2016.<sup>2</sup>

Senate Report 113-176, accompanying the National Defense Authorization Act for Fiscal Year 2015, included a provision that we review MCPP-N. In this report we determine the extent to which (1) MCPP-N addresses U.S. European Command and U.S. Africa Command requirements; (2) reliable cost estimates exist to fund MCPP-N's sustainment of equipment to support a Marine Air Ground Task Force capability; and, (3) the Marine Corps has quality assurance procedures in place to monitor the management of MCPP-N.

To determine the extent to which MCPP-N addresses U.S. European Command and U.S. Africa Command requirements, we obtained and reviewed Marine Corps plans and policies on MCPP-N detailing the program and its support to the Marine Corps and combatant commands; collected and reviewed combatant command contingency plans containing information on their strategic and operational requirements, including the need for a Marine Air Ground Task Force capability. We focused our review on ground equipment, rather than aviation support equipment, stored at MCPP-N because the program is transforming the ground equipment set from an engineering and transportation capability to a combat capability that supports a Marine Air Ground Task Force. To determine the extent to which reliable cost estimates exist to fund MCPP-N's sustainment of equipment to support a Marine Air Ground Task Force capability, we collected and analyzed projected budget data for MCPP-N from fiscal years 2015 through 2019 to identify the process and steps used to develop the budget estimates. We assessed the data to determine whether they were sufficiently reliable for our purposes and met GAO's Cost Estimating and Assessment Guide criteria for best practices for reliable cost estimates.<sup>3</sup> Because the budget estimates did

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<sup>1</sup> The Marine Air Ground Task Force is a balanced combination of ground, aviation, and logistics combat forces. As the Marine Corps' principal organizational construct, it provides Combatant Commanders or Joint Task Force commanders with scalable and versatile expeditionary forces that are able to respond to a broad range of crisis and conflict.

<sup>2</sup> U.S. Marine Corps, NAVMC 2907: *Prepositioning Objective for Maritime Prepositioning Force and Marine Corps Prepositioning Program-Norway*, (Washington, D.C.: Feb. 27, 2015).

<sup>3</sup> GAO, *GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Cost*, [GAO-09-3SP](#) (Washington, D.C.: March 2009).

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not meet all of the characteristics of a reliable cost estimate, we considered them not to be fully reliable. To determine the extent to which the Marine Corps has quality assurance procedures in place to monitor the management of MCPP-N, we obtained copies of quality assurance instruction documents and collected and analyzed quality assurance reports. We conducted a site visit to MCPP-N to observe base facilities, equipment stored in caves, and related logistics movement capabilities. We interviewed officials at Headquarters Marine Corps, Marine Corps Blount Island Command, Marine Corps Logistics Command Comptroller, U.S. European Command, U.S. Africa Command, Marine Forces Europe and Africa, U.S. Embassy Oslo, Norway, and the Norwegian Defence Logistics Organization to learn about their roles and responsibilities in support of the program in Norway.

We conducted this performance audit from August 2014 to September 2015 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives, scope, and methodology.

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## Background

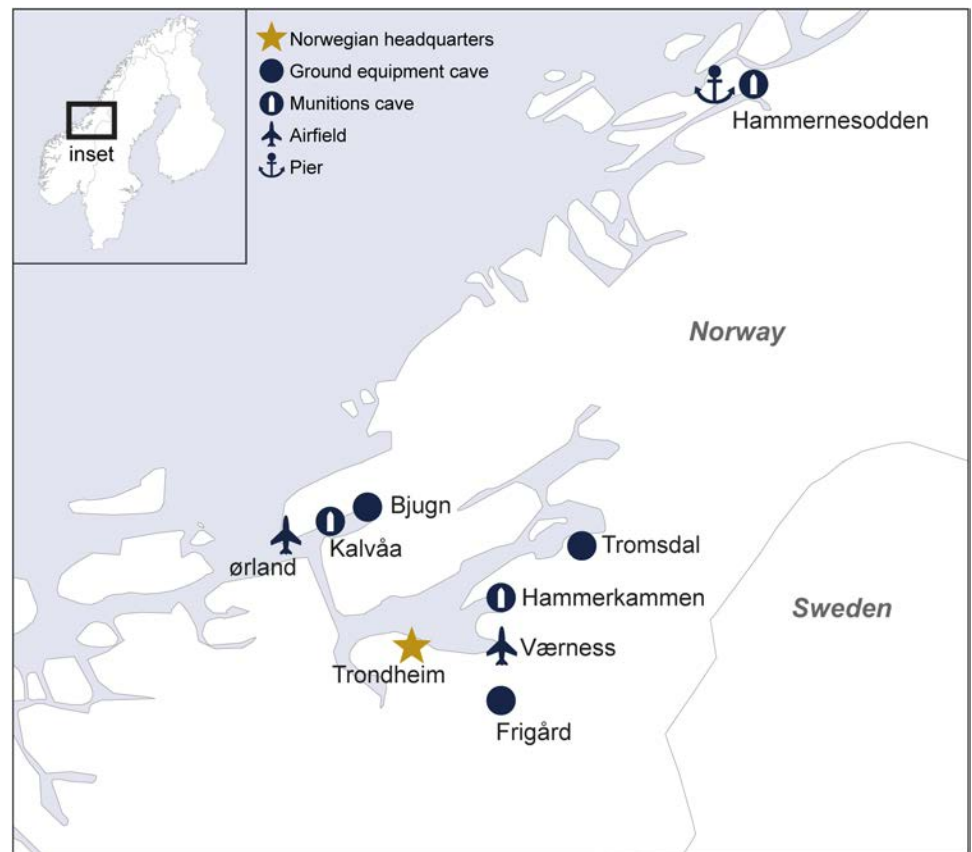
MCPP-N consists of six climate-controlled caves spread across central Norway that are used for the storage of U.S.-owned munitions and ground equipment.<sup>4</sup> In addition, the Norwegian Defence Logistics Organization manages two aviation maintenance facilities that contain U.S.-owned aviation support equipment, co-located at Norwegian airfields, and a pier used for offloading equipment from ships. Figure 1 identifies the locations of these caves, airfield maintenance facilities, and the pier.

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<sup>4</sup> The equipment maintained in Norway belongs to the U.S. Marine Corps with the exception of rations owned by the Defense Logistics Agency.



**Figure 1: Locations of the Marine Corps Prepositioning Program – Norway Storage and Maintenance Facilities, 2014**



Source: GAO. | GAO-15-651

According to Marine Corps officials, the Norwegian government completed construction of a new pier near the cave at Hammernesodden in July 2014 to facilitate the ability of large U.S. ships to transport large combat vehicles and other equipment into central Norway. Marine Corps and Norwegian officials stated that this pier was paid for solely by the Norwegian government at a cost of approximately \$22.5 million (see figure 2).

**Figure 2: Norwegian Constructed Pier in Hammernesodden, Norway, 2014**



Source: Norwegian Defence Logistics Organization. | GAO-15-651

In August 2014 the Navy and the Marine Corps transported a large shipment of combat and other equipment to Norway in support of a transformation to a Marine Air Ground Task Force capability, according to Marine Corps Blount Island Command and Norwegian officials. The equipment transported for storage in the six caves included variants of the M1114 High Mobility Multipurpose Wheeled Vehicle (HMMWV), M1A1 Main Battle Tanks, Tank Retrievers, Armored Breaching Vehicles, Amphibious Assault Vehicles, and several variants of the Medium Tactical Vehicle 7 ½-ton trucks. The photographs below (figs. 3 and 4) show the offloading of the USNS Williams at the newly constructed pier at Hammernesodden and provide an example of the type of ground equipment used to support a Marine Air Ground Task Force that can be found at MCPP-N caves.

**Figure 3: Equipment Offloading USNS Williams at Pier in Hammernesodden, Norway, 2014**



Source: Marine Forces Europe and Africa. | GAO-15-651

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**Figure 4: HMMWVs at Frigard Cave, Norway, 2014**



Source: GAO. | GAO-15-651

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## Program Costs

As part of the 2005 memorandum of understanding between the United States and Norway, the United States will provide military equipment to be stored in the Norwegian-built caves, and Norway will provide the infrastructure to support the program and will maintain the equipment provided by the United States.<sup>5</sup> Both countries agree to share the program's operations and maintenance expenses. Under the cost-sharing portion of the agreement, each country agrees to match the other's financial contributions up to an agreed upon threshold, which in fiscal year 2014 was \$10.5 million each. The cost-sharing agreement does set a maximum contribution by Norway, limiting its contribution either to half of the total costs incurred or to the ceiling set in U.S. dollars to be negotiated, whichever is less. Table 1 below illustrates the Marine Corps

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<sup>5</sup> DOD, *Memorandum of Understanding Governing Prestockage and Reinforcement of Norway* (Washington, D.C.: June 8, 2005).

and Navy's total annual contributions covering the actual direct and indirect programmatic costs for MCPP-N from fiscal years 2010 to 2014. According to officials from the office of the Deputy Commandant of the Marine Corps for Installations and Logistics, the direct costs for MCPP-N include all operations and maintenance expenses incurred by the Marine Corps for both ground equipment and aviation support equipment. In addition, indirect costs cover administrative expenses incurred by Blount Island Command and other Marine Corps organizations as part of the execution of the program.

**Table 1: Marine Corps and Navy<sup>a</sup> Annual Contributions to the Marine Corps Prepositioning Program – Norway for Fiscal Years 2010-2014**

(in thousands)	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
Direct Costs	\$6,649	\$5,960	\$7,825	\$8,736	\$11,945
Indirect Costs	\$4,697	\$4,697	\$4,697	\$4,697	\$4,697
<b>Total</b>	<b>\$11,346</b>	<b>\$10,657</b>	<b>\$12,522</b>	<b>\$13,432</b>	<b>\$16,642</b>

Source: Marine Corps Logistics Command | GAO-15-651.

<sup>a</sup>Navy annual contributions to MCPP-N provide aviation support to the 2nd Marine Aircraft Wing which is a component of the II Marine Expeditionary Force.

Organizational  
Responsibilities

Five organizations are responsible for the support and operation of MCPP-N. Four Marine Corps organizations are responsible for the planning, funding, and management of MCPP-N. The fifth organization, the Norwegian Defence Logistics Organization, is responsible for providing program infrastructure and maintaining MCPP-N equipment prepositioned in Norway. Table 2 below summarizes the primary roles and responsibilities of each organization.

**Table 2: Organizations and Their Roles and Responsibilities in Managing the Marine Corps Prepositioning Program – Norway**

Country/Organization	Roles and Responsibilities
<b>U.S. Marine Corps</b>	
Deputy Commandant for Plans, Policies, and Operations	Serves as the Commandant's executive agent and advocate for Marine Corps' prepositioning programs. Establishes operational policies and procedures and represents the programs to the Office of the Secretary of Defense, Joint Staff, and Department of the Navy.
Deputy Commandant for Installations and Logistics	Serves as the budget and logistics sponsor for the Marine Corps' prepositioning programs. Leads the sequential planning process that determines the Marine Corps' prepositioning objective.
Commanding General, Marine Corps Logistics Command	Serves as Marine Corps' lead for attaining, maintaining, and providing logistics support for Marine Corps prepositioned equipment and supplies.
Blount Island Command	Plans, coordinates, and executes the logistics efforts in support of the Marine Corps' prepositioning programs.
<b>Norway – Ministry of Defence</b>	
Norwegian Defence Logistics Organization	Plans, schedules, and performs equipment maintenance. Performs logistics functions, including inventory management, maintenance of technical data, facility utilization planning, training, and computer resource support.

Source: GAO Analysis of Marine Corps guidance| GAO-15-651.

## MCPN Is Changing Its Equipment Mix to Address U.S. European Command and U.S. Africa Command Requirements

The Marine Corps is changing its mix of equipment to address the U.S. European and U.S. Africa commands' strategic and theater-specific operational requirements. Both combatant commands have identified in their contingency plans the need for prepositioned equipment within their respective geographic areas to support their operational requirements and capabilities. The U.S. European Command's Theater Posture Plan identifies Trondheim, Norway, as a stand-alone prepositioning site for MCPN capable of providing equipment to a wide variety of operations. In addition, officials from the U.S. European Command stated that they have developed and are continuing to develop contingency plans that specifically call upon the Marine Corps to maintain prepositioned equipment in Europe to support strategic and theater-specific operational



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requirements. Although those U.S. Africa Command plans that reference a need for access to prepositioned equipment do not specifically identify MCPP-N as an asset to meet that need, both Marine Corps and U.S. Africa Command officials stated that MCPP-N has served and can continue to serve as a global support asset to meet combatant command requirements.

Both U.S. European and U.S. Africa Command identify prepositioned equipment in their contingency plans as providing capabilities to support efforts such as crisis response, humanitarian and disaster assistance, and counter-terrorism activities. The Marine Corps reported that it routinely uses MCPP-N equipment sets to support European training and exercises, including the biennial Cold Response exercise in Norway, which trains U.S., Norwegian, and other NATO-allied military forces to operate in cold weather environments; and an annual training activity to carry out security cooperation efforts with the Marine Corps' Black Sea Rotational Force and other foreign militaries. Marine Corps officials stated that MCPP-N equipment has been used to support training and exercises across the African continent, including the Shared Accord and African Lion exercises, and could be used for other assistance efforts in Africa.

From February 1991 to March 2014 the Marine Corps reported that it withdrew equipment from MCPP-N caves in support of training, exercises, and operations within Europe, Africa, Iraq, and Afghanistan. These principal end items included tanks, amphibious armored vehicles, light armored vehicles, trucks, and tractors. Marine Corps officials estimated<sup>6</sup> during this period that more than 3,000 principal end items were withdrawn from MCPP-N in support of various training and exercise events, and more than 2,000 principal end items were withdrawn in support of military operations in Iraq and Afghanistan. Further, officials estimated more than 150 principal end items were withdrawn to support other contingency operations within the European Command's geographic area, ranging from supporting a Special Purpose Marine Air

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<sup>6</sup> The Marine Corps provided us with a compilation of withdrawal data of principal and non-principal end items from MCPP-N storage caves from February 1991 to March 2014. Marine Corps officials reported that these withdrawal data were compiled from exercise after-action reports, available historical records from Marine Corps Headquarters and Blount Island Command, and other available Marine Corps correspondence identifying the types and quantities of equipment withdrawn. Marine Corps officials could not attest to the level of completeness of the estimates provided, and therefore they are of undetermined reliability.

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Ground Task Force in Spain to providing humanitarian assistance in Turkey and the Republic of Georgia. Marine Corps officials estimated that about 50,000 non-principal end items<sup>7</sup> such as sandbags, rations, tents, and cots were withdrawn from MCPP-N over the same period to support various training and exercises as well as contingency operations in Europe, Africa, Iraq, and Afghanistan. In addition, Marine Corps officials reported that MCPP-N equipment was used to provide humanitarian and disaster relief assistance in response to a major earthquake in Turkey in 2011 and wildfires in Russia in 2010. Further, Marine Corps officials stated that the same equipment used for training in cold weather environments could also support DOD's Arctic Strategy<sup>8</sup> for potential military operations in the Arctic regions, although officials stated that the Marine Corps has conducted no such operations to date.

In January 2012 the Commandant of the Marine Corps issued planning guidance that called for MCPP-N to be able to support a Marine Air Ground Task Force. Subsequently, the Marine Corps began its effort to change the mix of equipment found at MCPP-N storage facilities. This change occurred as a response to DOD's efficiency initiatives, to strengthen the effectiveness of MCPP-N, and to bolster the Marine Corps' prepositioning capabilities. In addition, as a result of the Department of the Navy's decision to discontinue in 2012 a maritime prepositioning ship squadron located within the Mediterranean, the U.S. European Command has heightened its reliance on MCPP-N to support its prepositioning requirements. The Marine Corps guidance specifically calls for MCPP-N to be able to support a force of approximately 4,500 Marines to respond to the first 2 weeks of combat at the mid-intensity conflict level of the range of military operations, and to support theater security cooperation activities. Marine Corps officials stated that the equipment set at MCPP-N is intended to provide the capabilities to enable a Marine Corps force to respond to any type of crisis or operation globally, and thus MCPP-N is not assigned to any specific combatant command.

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<sup>7</sup> In addition to the estimated 50,000 non-principal end items, Marine Corps officials from the Deputy Commandant for Plans, Policies, and Operations estimated that about 650,000 non-principal end items were withdrawn to provide disaster response to the 1995 Norwegian floods.

<sup>8</sup> DOD, *Arctic Strategy*, (Washington, D.C.: November 2013).



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To ensure that MCPP-N effectively meets the Marine Corps' needs and better aligns with combatant command strategic and theater-specific operational requirements, the Marine Corps annually updates the mix of equipment found at MCPP-N storage facilities in Norway. The current prepositioning objective, which was last revised in February 2015, calls for MCPP-N to support crisis response-type missions and theater security cooperation engagement activities for the combatant commands.<sup>9</sup> It also calls for an equipment set that includes combat equipment such as HMMWVs, light armored vehicles, amphibious armored vehicles, and Abrams tanks necessary to support mid-intensity conflicts. Marine Corps officials stated that as of March 2015 MCPP-N had acquired 63 percent of the equipment it needed to meet its current prepositioning objective. Marine Corps officials we interviewed observed, however, that this attainment level of equipment may change periodically, depending on the Marine Corps' identified prepositioning needs, as the prepositioning objective is generally revised on an annual basis.

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## Marine Corps' Cost Estimates for Funding MCPP-N's Equipment Sustainment May Not Be Fully Reliable

Marine Corps cost estimates for sustaining the equipment to support a Marine Air Ground Task Force capability may not be fully reliable, in that they do not fully meet the four general characteristics for reliable cost estimating—that is, being accurate, well-documented, credible, and comprehensive—as identified in GAO's Cost Estimating and Assessment Guide. Reliable cost estimates provide the basis for informed investment decision making and realistic budget formulation and program resourcing.

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<sup>9</sup> NAVMC 2907.

## Marine Corps Develops Program Objective Memorandum for Marine Corps Prepositioning Program - Norway

Each year, the Logistics Plans and Operations Branch of the Deputy Commandant of the Marine Corps for Installations and Logistics consolidates the Marine Corps' portion of direct program costs<sup>10</sup> for MCPP-N in support of developing a consolidated and comprehensive budget estimate for the program objective memorandum.<sup>11</sup> This includes a 5-year budget projection to fund program initiatives—such as the cost-sharing agreement with Norway—and theater security cooperation requirements for the U.S. European and U.S. Africa Commands. Current Marine Corps guidance requires budget estimates to contain defensible funding requirements that extend across multiple fiscal years and support both short- and long-term program objectives. The Marine Corps' approved program objective memorandum for MCPP-N for fiscal years 2015 to 2019 includes budget estimates (see table 3) for direct costs for operations and maintenance.

**Table 3: Marine Corps Prepositioning Program - Norway Budget Estimates for Direct Costs for Operations and Maintenance for Fiscal Years 2015 to 2019<sup>a</sup>**

Fiscal Year	2015	2016	2017	2018	2019	Total
Dollars (in thousands)	\$5,353	\$5,482	\$5,539	\$5,537	\$5,631	\$27,542

Source: Marine Corps Installation and Logistics, Logistics Plans and Operations Branch| GAO-15-651.

<sup>a</sup>These estimates only include projected Marine Corps' costs for operations and maintenance of MCPP-N ground equipment and do not include other projected costs, such as the Navy's support to the 2nd Marine Air Wing's aviation support equipment.

## Marine Corps Cost Estimates for MCPP-N Are Not Fully Reliable

According to GAO's Cost Estimating and Assessment Guide, the cost estimate is a critical element in the budgeting process that helps decision makers to evaluate resource requirements at milestones and other important decision points. Cost estimates establish and defend budgets and drive affordability analyses.<sup>12</sup> The guide identifies four characteristics

<sup>10</sup> The Marine Corps' portion of direct program costs that we assessed is maintained under the 1B1B budget account that represents funds specifically allocated by Congress for prepositioning.

<sup>11</sup> The program objective memorandum is a recommendation from the services and other defense agencies to the Secretary of Defense concerning how they plan to allocate resources for a program to meet the service program guidance and Defense Planning Guidance. The program objective memorandum covers the 5-year Future Year Defense Program and presents the services' and other defense agencies' proposal on how they will balance their allocation of available resources.

<sup>12</sup> [GAO-09-3SP](#).

of reliable cost estimates—that is, they should be accurate, well-documented, credible, and comprehensive. Based on our review of the budget estimates identified in the program objective memorandum budget for MCPP-N for fiscal years 2015 to 2019, we found that the Marine Corps' cost estimates for MCPP-N (1) partially met the “accurate” characteristic; (2) partially met the “well-documented” characteristic; (3) did not meet the “credible” characteristic; and (4) partially met the “comprehensive” characteristic of a reliable estimate. Table 4 provides more information on our assessment of the program objective memorandum budget for MCPP-N based on the four characteristics.

**Table 4: GAO’s Assessment of the Marine Corps Prepositioning Program – Norway’s Projected Budget for Fiscal Years 2015 – 2019 Based on the Four Characteristics of a Reliable Cost Estimate**

Characteristic	Best Practices	Assessment Rating <sup>a</sup>	Brief Explanation of GAO’s Assessment
Accurate	Estimates are accurate when they are adjusted properly for inflation and contain few, if any, minor mistakes. Cost estimates should be updated regularly to reflect significant changes so that they are always reflecting the current status, and should be based on historical costs.	Partially Met	The Marine Corps updates its cost estimates annually as part of the budget execution and program objective memorandum development process, but variances between planned and actual costs are not tracked, and source data and calculations for all cost elements are not documented.
Well-documented	Well-documented cost estimates are supported by detailed documentation that describes how they were derived and how they expect funding will be spent to achieve a given objective.  Documentation should include discussions of how cost estimates were normalized and evidence that the cost estimates were reviewed and accepted by management.	Partially Met	The Marine Corps described its process for developing the program objective memorandum and its approval, but did not provide documentation showing source data used to develop cost estimates, or a description of how the estimates were developed.
Credible	Cost estimates should be cross-checked to determine whether other estimating methods produce similar results.	Not Met	The Marine Corps did not compare or cross-check the estimating methods when developing its estimates.
Comprehensive	Comprehensive cost estimates should include all costs necessary to achieve agency objectives; a standardized structure that allows a program to track cost and schedule consistently over time; sufficient detail to ensure that cost elements are neither omitted nor double-counted; and all cost-influencing ground rules and assumptions.	Partially Met	The Marine Corps included all program costs associated with the prepositioning program in Norway, but did not identify a specific funding plan to transition the program to a Marine Air Ground Task Force; did not have a standardized structure for collecting detailed costs; and did not include all cost-influencing ground rules and assumptions.

Source: GAO | GAO-15-651

<sup>a</sup>We assessed each characteristic by assigning each individual rating a number: Not Met = 1, Minimally Met = 2, Partially Met = 3, Substantially Met = 4, and Met = 5. We took the average of the individual assessment ratings to determine the overall rating for each of the four characteristics. The

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resulting average becomes the overall assessment, as follows: Not Met = 1.0 to 1.4, Minimally Met = 1.5 to 2.4, Partially Met = 2.5 to 3.4, Substantially Met = 3.5 to 4.4, and Met = 4.5 to 5.0. A cost estimate is considered reliable if the overall assessment ratings for each of the four characteristics are substantially or fully met. If any of the characteristics are not met, minimally met, or partially met, then the cost estimate does not fully reflect the characteristics of a reliable estimate.

We found that the cost estimates partially met the characteristic for accuracy in that the Marine Corps program objective memorandum estimates for MCPP-N are updated as part of both the budget execution and program objective memorandum development processes. However, officials at the Office of the Deputy Commandant for Installations and Logistics told us that while Marine Corps components maintain source data or calculations, the components are not required to include this information as part of their cost estimate submissions. In addition, the Marine Corps does not track the variances between planned and actual costs to demonstrate the accuracy of its cost estimates and how the program is changing over time. We, therefore, could not assess whether the estimates were properly adjusted for inflation, nor could we check the results for accuracy. Without access to cost estimate details, the accuracy of the estimates cannot be determined.

We found that the cost estimates partially met the well-documented characteristic in that the documentation provided by the Marine Corps does not include the source data used to develop the cost estimates for the program objective memorandum process. The documentation does not reflect the calculations performed or the estimating methodologies used by the Marine Corps, and does not describe the step-by-step process used to develop the estimate. Without well-documented cost estimates that include calculations and estimating methodologies, the Installations and Logistics office cannot provide complete answers to questions about the development of cost estimates or explain the reasons behind changes to the estimates over time.

We found that estimates did not meet the characteristic for credibility. Based on our review of the program objective memorandum documentation for MCPP-N, we did not find documentation to demonstrate that systematic cross-checks of major cost elements were performed. Marine Corps Installation and Logistics officials stated that they do not perform cross-checks to assess the component and subordinate commands' proposed budget estimates, and that if questions arise about the components and subordinate commands' assumptions they engage in discussions to understand the reasoning behind them. However, this method used by the Installations and Logistics office to determine the accuracy of the components' and subordinate commands'

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assumptions cannot easily be replicated by an independent party. Such cross-checks of major cost elements can reveal whether applying a different cost-estimating method produces similar results. Without credible cost estimates, the Installations and Logistics office may not be able to determine the level of risk, uncertainty, or confidence associated with achieving proposed budget estimates. Consequently, management may have difficulty in identifying the available resources needed to address budget estimates in future program objective memorandum cycles to meet MCPP-N program requirements.

We found the cost estimates to be partially comprehensive in that they included all types of program costs supporting MCPP-N but did not include a detailed funding plan on the costs to transform the program to support a Marine Air Ground Task Force. Marine Corps officials stated that they had no specific funding plan for the transformation because it was not a fiscally driven event. Officials stated, however, that identifying all costs associated with the transformation would prove difficult because they do not track all funding sources that support MCPP-N, such as transportation costs, which are tracked through a separate budget account. However, we found that they did identify some costs needed to support the transformation. For instance, officials identify costs of about \$750,000 for fiscal year 2016 to employ three U.S. contractors in Norway to manage cryptographic equipment as part of a caretaker detachment. They also stated that between fiscal years 2012 and 2013 about \$2 million was apportioned from another repositioning program source to procure support items such as ancillary gear, lubricants, and batteries to operate and sustain new equipment supporting the Marine Air Ground Task Force.

We also found that there was no standardized structure for collecting costs at a level of detail necessary to demonstrate that estimates are acceptable and reflect justification of resources. While Marine Forces generally are required to submit budget requests in a specific template to the Marine Corps' Logistics Plans and Operations Branch, Blount Island Command is not required to use any template. Further, the cost-estimating documentation provided within the program objective memorandum submission did not include specific details on all factors and assumptions influencing costs, such as inflation indexes and potential costs arising from the purchase of parts to support new equipment sets such as tanks, amphibious assault vehicles, light armored vehicles, and communication capabilities. By not having a standardized structure for collecting cost estimates across organizations, the Installations and

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Logistics office cannot be certain that it has all the information necessary to ensure that the cost estimates provided are correct.

Marine Corps officials stated that while they have taken some steps to improve their cost estimates for developing the budget, the current DOD guidance for developing the program objective memorandum does not include procedures that embody the characteristics of reliable cost estimating as identified in GAO's prior work. In their view, better guidance would enable them to ensure that subordinate and component commands understand how to develop and document cost estimates. Officials stated that in response to recent changes with the consolidation of the program objective memorandum for prepositioning programs,<sup>13</sup> the Marine Corps is drafting guidance for assisting in the development of budget plans. As of May 2015 the draft guidance had not been finalized, but Marine Corps officials stated they had no plans for the new guidance, which they expect to issue in the fall of 2015, to address the four characteristics of reliable cost estimates.

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## Marine Corps Reliance on the Norwegian System Poses Management Challenges and Data Reliability Risks, and Quality Assurance Procedures Do Not Include a Review of the System

The Marine Corps relies upon the Norwegian Equipment Information Management System for data needed to manage its equipment inventory at MCPP-N due to long-standing limitations in the Global Combat Support System - Marine Corps. Although the Marine Corps is working to improve its information system, these solutions will likely take several years to implement. The reliance on two different information systems, one of which is owned and operated by a foreign government, creates several management challenges and risks to data reliability for the Marine Corps. For example, it results in a time lag in the accuracy of information in the Marine Corps system until that system is manually updated with information from the Norwegian system—a process that is time-consuming and vulnerable to the risk of introduction of errors. However, the Marine Corps and the Norwegians have taken some steps to mitigate these risks for the interim until the Marine Corps system is capable of replacing the Norwegian system. Additionally, relying on the Norwegian system for management information makes the Marine Corps vulnerable to any weaknesses that may exist within the Norwegian system.

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<sup>13</sup> In fiscal year 2011, the Marine Corps consolidated the program objective memorandum for the Marine Corps Prepositioning Program – Norway and the Maritime Prepositioning Force. Prior to this change, the Norway Program and Maritime Prepositioning Force were budgeted separately.

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Nevertheless, the Marine Corps has not conducted a quality assurance review of the Norwegian system. Performing such a review would be consistent with Marine Corps regulations and federal internal control standards, and it would constitute a key step toward mitigating potential weaknesses in the Norwegian Equipment Information Management System.

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### The Marine Corps Relies on Data from the Norwegian Equipment Information Management System to Manage Its MCPP-N Equipment Inventory

The Marine Corps relies on two different information systems—(1) the Global Combat Support System - Marine Corps, and (2) the Norwegian Equipment Information Management System—to maintain visibility and accountability over prepositioned assets stored at MCPP-N. The Global Combat Support System - Marine Corps is the service's enterprise-wide logistics information management system designed to serve as the backbone for all logistics information required by a Marine Air Ground Task Force. The Norwegian Equipment Information Management System is the data system that the Marine Corps and its Norwegian counterparts relied on to manage the ground equipment until 2012. Since July 2012, Blount Island Command has used the Global Combat Support System - Marine Corps<sup>14</sup> as the official program of record for maintenance, spare parts, and cost data related to the management of MCPP-N equipment.

However, due to limitations in the Marine Corps' system, the Marine Corps continues to rely on the Norwegian system for key inventory management data. For example, the Global Combat Support System - Marine Corps lacks a warehousing application and other data management capabilities that Blount Island Command needs to effectively manage MCPP-N equipment stored in the Norwegian caves. As noted earlier, Marine Corps equipment is distributed among six caves. While the current version of the Global Combat Support System – Marine Corps can track which cave each piece of equipment is stored in, the system cannot record the equipment's specific location within the cave. According to Norwegian officials, given the size of the caves, having the equipment's specific location within each cave is essential for efficient equipment management. For example, the exact location of the

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<sup>14</sup> GAO, *Defense Major Automated Information Systems: Cost and Schedule Commitments Need to Be Established Earlier*, [GAO-15-282](#) (Washington, D.C.: February 26, 2015). The Global Combat Support System - Marine Corps is the primary technology enabler for the Marine Corps' logistics modernization strategy and provides the backbone for all logistics information required by the Marine Air Ground Task Force.

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equipment is critical to conducting efficient inventory checks and scheduled maintenance, and for withdrawing equipment for training exercises, humanitarian relief efforts, and contingency operations. As a result, the Marine Corps is reliant on the Norwegian System for this information.

These limitations in the capabilities of the Global Combat Support System – Marine Corps are long-standing issues that the Marine Corps has recognized and is working to address. For example, as we reported in March 2014, according to Marine Corps Business System Integration Team officials, the initial plan was for the first version of the Global Combat Support System - Marine Corps, referred to as Increment 1, to include a warehousing application.<sup>15</sup> However, as the rollout progressed through 2012, the officials stated that technical challenges, cost increases, and schedule delays caused the Marine Corps to lack sufficient funds to incorporate the warehousing application in Increment 1. Over the past several years we have issued a series of reports on the acquisition of major automated information systems. Our 2014 and 2015 reports included a review of the Global Combat Support System - Marine Corps and the associated challenges entailed in implementing Increment 1.<sup>16</sup>

According to officials from Blount Island Command, when it became apparent that Increment 1 would lack the needed warehousing application, the Marine Corps explored available options with the Norwegian Defence Logistics Organization. They elected to continue using the Norwegian Equipment Information Management System because it contained a warehousing and inventory management application. Marine Corps Headquarters and Blount Island Command officials stated that they intend to discontinue their reliance on the Norwegian system once a warehousing application becomes available on the Marine Corps' system. In the meantime, they will rely on the two information systems to provide all the computer functions necessary for effective inventory management. Marine Corps officials stated that they

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<sup>15</sup> GAO, *Major Automated Information Systems: Selected Defense Programs Need to Implement Key Acquisition Practices*, [GAO-14-309](#) (Washington, D.C.: Mar. 27, 2014). The Global Combat Support System—Marine Corps Increment 1 was intended to support logistics planners and operators worldwide to manage combat logistics, including planning, warehousing, distribution, depot maintenance, and asset visibility.

<sup>16</sup> [GAO-14-309](#) and [GAO-15-282](#).



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did not know when the warehousing application will become available but expect it to be incorporated into a future increment, provided that there are available funds.<sup>17</sup>

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### Reliance on Two Information Management Systems to Store Inventory Data Creates Management Challenges and Data Reliability Risks

While Marine Corps and Norwegian officials agree that retaining the Norwegian system is the best available option until the Marine Corps system is capable of completely replacing the Norwegian system, several challenges exist with respect to managing the interface between the two independent information systems. For example, because these systems are owned by separate governments, security concerns prevent the Marine Corps from allowing the systems to directly interact electronically. Consequently, inventory data from the Norwegian Equipment Information Management System is required to be manually extracted and uploaded into the Global Combat Support System – Marine Corps. This results in a time lag for the accuracy of information in the Marine Corps system, until it is manually updated with information from the Norwegian system—a process that is time-consuming and creates the risk for errors. The Marine Corps and the Norwegians have taken some steps to mitigate the risks in this process until the Marine Corps system replaces the Norwegian system. For example, Blount Island Command and Norwegian Defense Logistics Organization officials stated that they have a process to identify discrepancies between the two systems and then use a Marine Corps contractor to validate and enter inventory data from the Norwegian system to update the Marine Corps system.

The following overview of the flow of inventory data as equipment arrives and is stored in the six Norwegian caves shows how data reliability challenges arise from the use of these two systems. Specifically, equipment designated for MCPP-N is assigned to Blount Island Command in the Global Combat Support System – Marine Corps. After undergoing a maintenance process at Blount Island Command to ensure that it is ready for use, the equipment is shipped to Norway for storage, and its shipment data are entered into the Marine Corps system. As was explained and demonstrated to us, when equipment arrives in Norway,

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<sup>17</sup> Global Combat Support System - Marine Corps, Business System Integration Team officials stated that the plan for Increment 2 of the Global Combat Support System - Marine Corps is to develop and incorporate a modern Tactical Warehouse Management System. In May 2015 officials stated that Increment 2 was in the early conceptual stage, and a timeline for its implementation had not yet been determined.

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the Norwegian Defence Logistics Organization records its receipt and inventory data in the Norwegian Equipment Information Management System. Once the Norwegian staff have assigned an equipment storage location—the designated cave and the equipment’s location within that cave—they transfer the key data elements that can be added to the Marine Corps system to an interim database known as the “Change Log.” Norwegian officials explained that one of their former staff created the Change Log feature in the Norwegian system in January 2014 to provide a mechanism whereby Norwegian staff could resolve discrepancies in the inventory data between the Marine Corps and Norwegian systems, in consultation with the Marine Corps contractors. The contractors receiving data from the Change Log are responsible for reviewing and validating the submitted equipment’s cave location and other inventory data before updating the record in the Global Combat Support System - Marine Corps.

According to Norwegian officials, the Change Log has been instrumental in reducing the backlog of data discrepancies from more than 3,000 in January 2014 to fewer than 800 in November 2014. They explained that these discrepancies between the Marine Corps and Norwegian systems developed largely due to the changing mix of equipment prepositioned at MCPP-N to support a Marine Air Ground Task Force capability. Norwegian officials also reported mismatches in equipment serial numbers in both systems. They stated that as a result of such problems, a physical check of the serial number is often required to reconcile the data discrepancies between the two systems. Norwegian officials indicated that having its maintenance personnel provide additional information (documentation and photographs) to reconcile inventory data between the two systems negatively affects Norwegian maintenance operations because they have limited time maintenance resources.

The Change Log serves as an application control for information entering the Global Combat Support System - Marine Corps. Standards for Internal Control in the Federal Government state that an application control should be installed at an application’s interface with other systems to ensure that all inputs are received and that valid outputs are correct and properly distributed.<sup>18</sup> The Change Log constitutes a computerized

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<sup>18</sup> GAO, *Standards for Internal Control in the Federal Government*, [GAO/AIMD-00-21.3.1](#) (Washington, D.C.: November 1999).

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“edit” built into the interface that helps the Marine Corps to review the format, existence, and reasonableness of the data from the Norwegian system before it enters the Marine Corps system.

While the Change Log demonstrates an application control to mitigate data discrepancies between the two information management systems, it does not represent a long-term solution. Marine Corps and Norwegian officials anticipate that data discrepancies will continue to occur whenever there is a change in the cave location of equipment—such as when it returns to a cave after maintenance, a training exercise, humanitarian relief effort, or contingency operation—and also when it enters a cave for the first time, due to decisions to upgrade or change the mix of preposition equipment. Until the Global Combat Support System – Marine Corps is modified to include a warehousing application and can replace the Norwegian system, Marine Corps and Norwegian officials will continue to rely on two information management systems that generate ongoing data discrepancies and related data reliability challenges.

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### Marine Corps’ Annual Quality Assurance Inspection Process Does Not Include a Review of the Norwegian Equipment Information Management System

The Marine Corps’ Blount Island Command conducts an annual quality assurance inspection to monitor, measure, and analyze data to ensure the effectiveness of MCPP-N. This inspection includes an assessment of the condition of the equipment and of the maintenance processes, along with a review of the inventory. However, the quality assurance inspection does not include a review of the Norwegian Equipment Information Management System, which serves as one of the key reporting systems for managing inventory data. Performing such a review would be consistent with Marine Corps regulations and federal internal control standards and would constitute a key step toward mitigating potential weaknesses in the Norwegian Equipment Information Management System.

The data standards for information systems supporting Marine Corps prepositioning are provided in Marine Corps Order 3000.17 and state that data must be accurate and timely, must provide visibility of prepositioning materiel to planners at all levels, must be maintained to standards at the source of generation, and must be standardized for both afloat and ashore prepositioning programs.<sup>19</sup> The Marine Corps Order also

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<sup>19</sup> Department of the Navy, Marine Corps Order 3000.17: *Marine Corps Prepositioning Programs*, (Washington, D.C.: October 17, 2013).

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references the Marine Corps Technical Manual for MCPP-N, which states that Blount Island Command is responsible for developing and administering the Quality Assurance Program, and that the Quality Assurance Program shall include a review of shelf life items, scheduled maintenance and inventory cycles, and the adequacy of reporting systems.<sup>20</sup> In addition, the Blount Island Command Quality System Manual states that Blount Island Command retains the overall responsibility for exercising sufficient control for processes performed by external organizations that provide logistics support for MCPP-N.<sup>21</sup>

Federal internal control standards also indicate the need for a quality assurance review of the Norwegian system. According to those standards, information systems have two main types of control activities—general and application controls.<sup>22</sup> General controls are the policies and procedures that apply to all or a large segment of an entity's information systems and facilitate their proper operation, to include system development and maintenance, security, management, logical and physical access, access security, and contingency planning. Application controls are incorporated directly into computer applications to achieve validity, completeness, accuracy, and confidentiality of transactions and data during application processing. According to the standards for internal controls, general and application controls over computer systems are interrelated. General controls support the functioning of application controls, and both are needed to ensure complete and accurate information processing. If general controls are inadequate, application controls are unlikely to function properly and could be overridden.

A quality assurance review can entail reviewing selected general and application controls within the information system through activities such as:

- reviewing operating and database management systems;

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<sup>20</sup>U.S. Marine Corps Technical Manual, *Logistics Support for Marine Corps Prepositioning Program—Norway*, TM 4790-14/1G (Washington, D.C., June 2013).

<sup>21</sup> Blount Island Command, *ISO 9001:2008 Quality System Manual*, Revision D, (Jacksonville, Florida: December 28, 2012).

<sup>22</sup> [GAO/AIMD-00-21.3.1](#).

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- assessing security controls that protect the system and network from inappropriate access or unauthorized use; and
  - performing tests on the system to ensure that it has the proper edit checks to review the format, existence, and reasonableness of data.

Further, the Local Bilateral Agreement for MCPP-N, which serves as an internal working document between Blount Island Command and the Norwegian Defence Logistics Organization and outlines roles and responsibilities for each organization, identifies Blount Island Command as being responsible for completing annual quality assurance inspections on the maintenance and storage of equipment managed by the Norwegian Defence Logistics Organization.<sup>23</sup> Blount Island Command officials stated that their annual quality assurance review does not focus on information systems, and they further noted that the Norwegians' system is foreign-owned and therefore not within their jurisdiction. The Local Bilateral Agreement does not specifically require the Marine Corps to conduct a review of the Norwegian System. However, as a working document the agreement is regularly updated and can be amended to incorporate additional provisions such as allowing the Marine Corps to conduct a quality review of the Norwegian system.

The Norwegian Equipment Information Management System provides the Marine Corps with capabilities not currently available in its own system, such as the ability to track equipment calibration and a warehousing function, but Norwegian Defence Logistics Organization officials stated that they recognized their system has certain vulnerabilities. For example, during our review of their information system we observed several weaknesses, including minimal documentation on the system, the lack of formal training and procedures for staff performing data entry, and the reliance on a single person, a retired Norwegian staff member, for the system's technical programming and maintenance needs. To address known data entry problems, Norwegian officials are considering a proposal that would limit the number of data entry points into the Norwegian system from three locations to one centrally managed location. However, Norwegian officials stated that they had not conducted an overall quality assurance review of the information system, thus raising further questions as to its potential vulnerabilities.

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<sup>23</sup> U.S. Marine Corps, *Local Bilateral Agreement*, 2013.

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Although the current Local Bilateral Agreement does not contain guidance and instructions for conducting an assessment of the Norwegian Equipment Information Management System, the Marine Corps is responsible for ensuring that the Norwegian system is providing accurate data on the inventory for stored assets being managed at MCPP-N. Further, Marine Corps officials stated that they rely on the Norwegian system to carry out data management functions discussed above. Without performing a quality assurance review of the Norwegian system, MCPP-N is at risk for incurring potential vulnerabilities in its inventory data. If the Marine Corps does not provide a quality assurance review of the Norwegian system, it may not be able to determine whether inventory data are complete, accurate, reliable, and reasonably free from error, so as to ensure that equipment is readily available to support the combatant commanders' requirements.

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## Conclusions

The Marine Corps is transforming MCPP-N's posture from an engineering and transportation capability to a balanced Marine Air Ground Task Force capability that supports both the U.S. European and U.S. Africa commands' operational requirements to obtain prepositioned equipment sets capable of supporting crisis response operations and theater security cooperation activities. While the Marine Corps continues to develop cost estimates for its budget to determine the level of funding needed to meet current and future program obligations for MCPP-N, its current methods do not fully meet the four characteristics of a reliable cost estimate. The Marine Corps has taken some steps to improve its efforts in developing reliable cost estimates by drafting new guidance for subordinate and component commands to develop budget estimates. While this represents a positive step, without fully incorporating the four characteristics of a reliable cost estimate in their draft guidance, the Marine Corps cannot ensure that its budget planning efforts for MCPP-N are based upon sound planning that is justifiable, defensible, and accountable.

Furthermore, the lack of a warehousing application in the Global Combat Support System - Marine Corps has limited Blount Island Command's ability to provide adequate visibility and accountability over prepositioned inventory stored in Norway, and consequently the Marine Corps continues to rely on the Norwegian Equipment Information Management System to manage the warehousing and inventory of equipment. Without a quality assurance review that assesses the Norwegian system, the Marine Corps cannot ensure that the inventory data it provides are accurate and reliable.

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## Recommendations for Executive Action

To better determine the costs needed to sustain the equipment to support a Marine Air Ground Task Force capability, we recommend that the Commandant of the Marine Corps direct the Deputy Commandant for Installations and Logistics to incorporate the four characteristics of reliable cost estimates in the Marine Corps' forthcoming prepositioning programs budget development policy, and specifically to take the following actions:

- To ensure that estimates are accurate and well-documented, require all relevant departments and subordinate commands to provide documentation of cost-estimating details that include both source data and calculations;
- To ensure that estimates are credible, implement management requirements to establish and conduct formal cross-checks of major cost elements among the relevant departments and subordinate commands to determine whether they are replicable; and
- To ensure that estimates are comprehensive, implement a standardized structure for collecting all the necessary details used to develop and support cost estimates from all relevant departments and subordinate commands.

As part of its quality assurance program for ensuring that the Marine Corps has accurate and reliable information on inventory data for stored assets used to support combatant commanders' requirements, we recommend that the Commandant of the Marine Corps, in consultation with the Norwegian Defence Logistics Organization, take steps to update the Technical Manual on Logistics Support for the Marine Corps Prepositioning Program – Norway and the Local Bilateral Agreement, to incorporate guidance and instructions on conducting a quality assurance review that assesses the accuracy and reliability of the Norwegian Equipment Information Management System.

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## Agency Comments and Our Evaluation

We provided draft copies of this report to the Department of Defense and the Department of State. Additionally, we provided relevant portions of the draft report to the Norwegian Defence Logistics Organization to ensure its technical accuracy. In written comments for DOD on this draft, the Marine Corps agreed with all four of our recommendations and its comments are reprinted in their entirety in appendix II. The Department of State had no comments on the draft report. The Norwegian Defence Logistics Organization generally agreed with the relevant portions of the draft that

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we sent them and provided technical comments that we incorporated as appropriate.

The Marine Corps concurred with our first, second, and third recommendations—that the Commandant of the Marine Corps direct the Deputy Commandant for Installations and Logistics to incorporate the four characteristics of reliable cost estimates in the Marine Corps' forthcoming prepositioning programs budget development policy, and specifically take actions to ensure that estimates are accurate and well-documented, credible, and comprehensive. The Marine Corps stated that the forthcoming Prepositioning Programs Budget Development Order will address the four characteristics of reliable cost estimates to ensure that estimates are accurate, credible, and comprehensive, and that the draft Budget Development Order will be initially staffed to the prepositioning community at the end of fiscal year 2015, with a target date for publishing by the end of the 2nd quarter of fiscal year 2016. We believe that these actions, if fully implemented, would address our recommendations.

The Marine Corps also concurred with our fourth recommendation—that the Commandant of the Marine Corps, in consultation with the Norwegian Defence Logistics Organization, take steps to update the Technical Manual on Logistics Support for the Marine Corps Prepositioning Program – Norway and the Local Bilateral Agreement, to incorporate guidance and instructions on conducting a quality assurance review that assesses the accuracy and reliability of the Norwegian Equipment Information Management System. The Marine Corps stated that it will incorporate guidance and instructions on conducting a quality assurance review that assesses the accuracy and reliability of the Norwegian Equipment Information Management System into the Technical Manual and Local Bilateral Agreement. The Marine Corps also stated that the use of the Norwegian system and the Change Log are not long-term solutions for the Marine Corps Prepositioning Program – Norway, and that as soon as the Global Combat Support System adds a warehousing module, currently under development, the Marine Corps will implement it in Norway. We acknowledge the current limitations of the Global Combat Support System in our report, and we believe that the Marine Corps' proposed actions regarding efforts to include a quality assurance review of the accuracy and reliability of inventory data from the Norwegian system address the intent of our recommendations. We further believe that these actions, if fully implemented, should help improve the quality of inventory information until the warehousing module for the Marine Corps is in place.



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We are sending copies of this report to the appropriate congressional committees, the Secretary of Defense, the Secretary of State, the Secretary of the Navy, the Commandant of the Marine Corps, and the Norwegian Defense Logistics Organization. In addition, this report is available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff members have any questions about this report, please contact Cary Russell at (202) 512-5431 ([russellc@gao.gov](mailto:russellc@gao.gov)). Contact points for our Office of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix III.

A handwritten signature in black ink, reading "Cary Russell". The signature is fluid and cursive, with the first name "Cary" and last name "Russell" clearly distinguishable.

Cary Russell  
Director, Defense Capabilities and Management

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# Appendix I: Scope and Methodology

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Senate Report 113-176, accompanying the National Defense Authorization Act for Fiscal Year 2015, included a provision that we review MCPP-N and determine the extent to which (1) MCPP-N addresses U.S. European Command and U.S. Africa Command requirements; (2) reliable cost estimates exist to fund MCPP-N's sustainment of equipment to support a Marine Air Ground Task Force capability; and, (3) the Marine Corps has quality assurance procedures in place to monitor the management of MCPP-N.

To determine the extent to which MCPP-N addresses U.S. European Command and U.S. Africa Command requirements, we obtained, reviewed, and analyzed plans, policies, and guidance on MCPP-N detailing the program and its support to the Marine Corps and combatant commands, such as the January 2012 Commandant of the Marine Corps Planning Guidance for Marine Corps Prepositioning Program—Norway.<sup>1</sup> We also reviewed GAO's prior work addressing DOD's management and reporting of prepositioning.<sup>2</sup> We collected and reviewed a theater posture plan and contingency plans obtained from the U.S. European Command and U.S. Africa Command on their strategic and operational requirements, including the need for a Marine Air Ground Task Force capability. We also collected documentation from the Marine Corps containing the type and mix of equipment required to support a Marine Air Ground Task Force. Further, we reviewed the combatant command plans to determine the extent to which they rely on prepositioned equipment to meet theater-specific requirements. We also collected and reviewed unit after action reports and briefings that provided an evaluation of the equipment obtained from MCPP-N for training and annual exercises, and to understand how the equipment met their needs. We collected documents from the Norwegian Armed Forces on Norway's role and relationship with MCPP-N and visited several cave sites in Norway to observe U.S.-owned equipment stored in support of the Marine Air Ground Task Force. We focused our review on ground equipment stored at MCPP-N because the program is transforming the equipment set from an engineering and transportation to a Marine Air Ground Task Force capability. We met with and interviewed various DOD and other

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<sup>1</sup> U.S. Marine Corps, *CMC Planning Guidance for Marine Corps Prepositioning Program – Norway* (Washington, D.C.: January 2012).

<sup>2</sup> A list of related GAO products on DOD's prepositioning program is included at the end of this report.

organizations that directly or indirectly support MCPP-N. Tables 5 and 6 include a list of the DOD and other organizations we met with and interviewed during our review.

**Table 5: Department of Defense Locations Visited and Contacted**

Organization	Location visited or contacted
Joint Chiefs of Staff	<ul style="list-style-type: none"> <li>U.S. European Command, Stuttgart, Germany <ul style="list-style-type: none"> <li>J4 Logistics Directorate</li> <li>J5/8 Policy, Strategy, Partnering Directorate</li> </ul> </li> <li>U.S. Africa Command, Stuttgart, Germany <ul style="list-style-type: none"> <li>J4 Logistics Directorate</li> </ul> </li> </ul>
Marine Corps	<ul style="list-style-type: none"> <li>Headquarter Marine Corps, Washington, D.C. <ul style="list-style-type: none"> <li>Deputy Commandant for Plans, Policies, and Operations</li> <li>Deputy Commandant for Installations and Logistics</li> </ul> </li> <li>Marine Corps Logistics Command, Comptroller, Albany, Georgia <ul style="list-style-type: none"> <li>Blount Island Command, Jacksonville, Florida</li> </ul> </li> <li>Marine Forces Europe and Africa, Stuttgart, Germany</li> <li>Global Combat Support System Marine Corps, Business System Integration Team, Quantico, Virginia</li> </ul>

Source: GAO | GAO-15-561.

**Table 6: Non-Department of Defense Organizations and Individuals Visited or Contacted**

Organization	Location visited or contacted
U.S. Department of State	<ul style="list-style-type: none"> <li>Bureau of European and Eurasian Affairs, Washington, D.C.</li> <li>U.S. Embassy, Oslo, Norway <ul style="list-style-type: none"> <li>Office of Defense Cooperation</li> <li>Political and Economic Section</li> </ul> </li> </ul>
Ministry of Defence for the Kingdom of Norway	<ul style="list-style-type: none"> <li>Defence Staff Norway <ul style="list-style-type: none"> <li>Norwegian Defence Logistics Organization, Trondheim, Norway</li> </ul> </li> </ul>

Source: GAO | GAO-15-651.

To determine the extent to which reliable cost estimates exist to fund MCPP-N's sustainment of equipment to support a Marine Air Ground Task Force capability and to identify the process and steps used to develop the budget estimates, we collected and analyzed projected budget data and supporting budget documentation for MCPP-N from fiscal years 2015 through 2019. We obtained a copy of the Marine Corps' program objective memorandum program review briefings from fiscal years 2015 through 2019 and conducted an analysis to determine how each cost element associated with budget estimate data was calculated by examining the basis of the budget estimates and assessing the strength and quality of the supporting budget documentation provided.

We verified that the parameters used to create the budget estimates were valid and applicable by posing formal questions and conducting interviews with officials in the Deputy Commandant for Installation and Logistics, Logistics Plans and Operations Branch, to understand their methodology for developing budget estimates, and determining whether other sources were available for cross-checking those estimates. We verified that calculations were correct for each cost element, and verified that elements were accurately summed up to arrive at the overall budget estimate. We assessed whether the budget estimates were sufficiently reliable for our purposes and met GAO's Cost Estimating and Assessment Guide for best practices,<sup>3</sup> and the four general characteristics of a reliable cost estimate—accurate, credible, well-documented, and comprehensive. Each characteristic consists of several individual assessments. We assessed each characteristic by assigning each individual assessment a numerical rating: Not Met = 1, Minimally Met = 2, Partially Met = 3, Substantially Met = 4, and Met = 5. We took the average of the individual assessment ratings to determine the overall rating for each of the four characteristics. The resulting average became the overall characteristic assessment as follows: Not Met = 1.0 to 1.4, Minimally Met = 1.5 to 2.4, Partially Met = 2.5 to 3.4, Substantially Met = 3.5 to 4.4, and Met = 4.5 to 5.0. A cost estimate is considered reliable if the overall assessment ratings for each of the four characteristics are substantially or fully met. If any of the characteristics are not met, are minimally met, or are partially met, the cost estimate does not fully reflect the characteristics of a reliable estimate. We recorded the results of our analysis and found that the budget estimates partially met the accurate, well-documented, and comprehensive characteristics, and that they did not meet the credible characteristic of a reliable estimate. Because the budget estimates did not meet all of the characteristics of a reliable cost estimate, we considered them not to be fully reliable.

To determine the extent to which the Marine Corps has quality assurance procedures in place to monitor the management of MCPP-N, we reviewed the May 2009 United States Marine Corps Technical Manual on Logistics Support for MCPP-N,<sup>4</sup> the 2013 Local Bilateral Agreement between

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<sup>3</sup> GAO, *GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs*, [GAO-09-3SP](#) (Washington, D.C.: March 2009).

<sup>4</sup> TM 4790-14/1G.

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Blount Island Command and Norwegian Defence Logistics Organization,<sup>5</sup> and the 2012 Blount Island Command ISO 9001:2008 Quality System Manual.<sup>6</sup> We obtained examples of annual quality assurance inspection and work instruction reports and analyzed the reports with the Marine Corps' quality assurance procedures to determine how their reviews were conducted. We also collected studies, reports, and briefings on the Global Combat Support System – Marine Corps and the Norwegian Equipment Information Management System to determine how the Marine Corps and Norwegians rely on these two information management systems to maintain visibility and accountability over prepositioned equipment in Norway. We conducted a series of interviews with Marine Corps and Norwegian officials using a set of standard data reliability questions to learn about their general and application controls for conducting system operations and data processing; the chain of custody used to transfer and record data between two information management systems that do not interface with each other because of jurisdiction boundaries; and the quality assurance procedures used to assess the reliability of inventory data and systems. We interviewed officials from Blount Island Command and Norwegian Defence Logistics Organization to learn about the challenges they have encountered in using two information management systems to support MCPP-N and the management oversight they have used to mitigate deficiencies. In addition, we conducted site visits at the Frigard cave, Hammernesodden cave and pier, and the aviation maintenance facilities at the Vaernes airfield. During these site visits, we observed and photographed their storage and maintenance facilities; observed the procedures Norwegian staff followed to enter data into the Global Combat Support System - Marine Corps and the Norwegian Equipment Information Management System; observed their data reconciliation procedures; and observed the manual record keeping they used to supplement their data entry procedures. While on site, we obtained copies or photographs of some of their training and reference materials and data entry procedures. Marine Corps and Norwegian officials provided us with system demonstrations of the Global Combat Support System and Norwegian Equipment Information Management System to acclimate us to both systems' data management features for tracking, recording, and storing data on prepositioned equipment. Finally, we interviewed officials from the Global Combat Support System Marine

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<sup>5</sup> U.S. Marine Corps, U.S. Marine Corps, *Local Bilateral Agreement*, 2013.

<sup>6</sup> Blount Island Command, *ISO 9001:2008* (December 28, 2012).

Corps' Business System Integration Team to inquire about the Marine Corps' plans to incorporate a warehousing application to allow Marine Corps organizations to collect inventory data.

We conducted this performance audit from August 2014 to September 2015 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provided a reasonable basis for our findings and conclusions.

# Appendix II: Comments from the Department of Defense



DEPARTMENT OF THE NAVY  
HEADQUARTERS UNITED STATES MARINE CORPS  
3000 MARINE CORPS PENTAGON  
WASHINGTON DC 20350-3000

IN REPLY REFER TO:  
1000  
POE  
August 13, 2015

Mr. Cary Russell  
Director, Defense Capabilities and Management  
U.S. Government Accountability Office  
441 G Street, NW  
Washington DC 20548

Dear Mr. Russell,

This is the Department of Defense (DoD) response to the GAO Draft Report GAO-15-651, "PREPOSITIONED STOCKS: Marine Corps Needs to Improve Cost Estimate Reliability and Oversight of Inventory Systems for Equipment in Norway," dated July 28, 2015 (GAO Code 351955).

The Department is providing official written comments for inclusion in the report.

Sincerely,

A handwritten signature in black ink, appearing to read "R. L. Bailey".

R. L. BAILEY  
Lieutenant General  
Deputy Commandant for Plans, Policies and  
Operations

Enclosure: (1) Department of Defense comments to the GAO recommendation

GAO DRAFT REPORT DATED JULY 28, 2015  
GAO-15-651 (GAO CODE 351955)

**“PREPOSITIONED STOCKS: MARINE CORPS NEEDS TO IMPROVE COST  
ESTIMATE RELIABILITY AND OVERSIGHT OF INVENTORY SYSTEMS FOR  
EQUIPMENT IN NORWAY”**

**UNITED STATES MARINE CORPS COMMENTS  
TO THE GAO RECOMMENDATIONS**

**RECOMMENDATION 1:** To better determine the costs needed to sustain the equipment to support a Marine Air Ground Task Force capability, GAO recommends that the Commandant of the Marine Corps direct the Deputy Commandant for Installations and Logistics to incorporate the four characteristics of reliable cost estimates in the Marine Corps' forthcoming prepositioning program budget development policy, and specifically to take the following actions:

- To ensure that estimates are accurate and well-documented, require all relevant departments and subordinate commands to provide documentation of cost-estimating details that include both source data and calculations.

**USMC RESPONSE:** Concur. The forthcoming Prepositioning Programs Budget Development Order will address the four characteristics of reliable cost estimates to ensure estimates are accurate, credible, and comprehensive. The draft Budget Development Order will be initially staffed to the prepositioning community in August 2015 with a target date for publishing by the end of the 2<sup>nd</sup> quarter of fiscal year 2016 (FY16).

**RECOMMENDATION 2:** To better determine the costs needed to sustain the equipment to support a Marine Air Ground Task Force capability, GAO recommends that the Commandant of the Marine Corps direct the Deputy Commandant for Installations and Logistics to incorporate the four characteristics of reliable cost estimates in the Marine Corps' forthcoming prepositioning program budget development policy, and specifically to take the following actions:

- To ensure that estimates are credible, implement management requirements to establish and conduct formal cross-checks of major cost elements among the relevant departments and subordinate commands to determine whether they are replicable.

**USMC RESPONSE:** Concur. The forthcoming Prepositioning Programs Budget Development Order will address the four characteristics of reliable cost estimates to ensure estimates are accurate, credible, and comprehensive. The draft Budget Development Order will be initially staffed to the prepositioning community in August 2015 with a target date for publishing by the end of the 2<sup>nd</sup> quarter of fiscal year 2016 (FY16).

**RECOMMENDATION 3:** To better determine the costs needed to sustain the equipment to support a Marine Air Ground Task Force capability, GAO recommends that the Commandant of



the Marine Corps direct the Deputy Commandant for Installations and Logistics to incorporate the four characteristics of reliable cost estimates in the Marine Corps' forthcoming prepositioning program budget development policy, and specifically to take the following actions:

- To ensure that estimates are comprehensive, implement a standardized structure for collecting all the necessary details used to develop and support cost estimates from all relevant departments and subordinate commands.

**USMC RESPONSE:** Concur. The forthcoming Prepositioning Programs Budget Development Order will address the four characteristics of reliable cost estimates to ensure estimates are accurate, credible, and comprehensive. The draft Budget Development Order will be initially staffed to the prepositioning community in August 2015 with a target date for publishing by the end of the 2<sup>nd</sup> quarter of fiscal year 2016 (FY16).

**RECOMMENDATION 4:** As part of its quality assurance program for ensuring that the Marine Corps has accurate and reliable information on inventory data for stored assets used to support combatant commanders' requirements, GAO recommends that the Commandant of the Marine Corps, in consultation with the Norwegian Defence Logistics Organization, take steps to update the Technical Manual on Logistics Support for the Marine Corps Prepositioning Program – Norway and the Local Bilateral Agreement, to incorporate guidance and instructions on conducting a quality assurance review that assesses the accuracy and reliability of the Norwegian Equipment Information Management System.

**USMC RESPONSE:** Concur. The Marine Corps' will incorporate guidance and instructions on conducting a quality assurance review that assesses the accuracy and reliability of the Norwegian Equipment Information Management System (NEIMS) to the Technical Manual and Local Bilateral Agreement. Currently, the accountable property system of record (APSR) for the MCPP-N is GCSS-MC and it's managed by Blount Island Command in Jacksonville, FL. The NEIMS is a warehousing program that is used in Norway to track inventory moving in and out of the caves, to include precise locations within the caves. The two systems, GCSS-MC and NEIMS, do not electronically interface and require a "Change Log" program to bridge the gap and keep the two systems in alignment. The Change Log captures data changes in NEIMS and enables Blount Island Command the ability to manually update the GCSS-MC records as required. The use of NEIMS and the Change Log are not long-term solutions for the MCPP-N and as soon as GCSS-MC adds a warehousing module, currently under development, the MCPP-N will implement it in Norway.

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# Appendix III: GAO Contact and Staff Acknowledgments

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## GAO Contact

Cary Russell, (202) 512-5431 or [russellc@gao.gov](mailto:russellc@gao.gov)

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## Staff Acknowledgments

In addition to the contact named above, Larry Juneke (Assistant Director); Brian Bothwell; Patricia Farrell Donahue, Ph.D.; Latrealle Lee; Felicia Lopez; Amie Steele; Sabrina Streagle; John Van Schaik; Cheryl Weissman; Erik Wilkins-McKee; and Richard Winsor made key contributions to this report.

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# Related GAO Products

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*Prepositioned Stocks: Additional Information and a Consistent Definition Would Make DOD's Annual Report More Useful*, [GAO-15-570](#). Washington, D.C.: June 16, 2015.

*Prepositioned Stocks: DOD's Strategic Policy and Implementation Plan*. [GAO-14-659R](#). Washington, D.C.: June 24, 2014.

*Prepositioned Stocks: Inconsistencies in DOD's Annual Report Underscore the Need for Overarching Strategic Guidance and Joint Oversight*, [GAO-13-790](#). Washington, D.C.: September 26, 2013.

*Prepositioned Materiel and Equipment: DOD Would Benefit from Developing Strategic Guidance and Improving Joint Oversight*. [GAO-12-916R](#). Washington, D.C.: September 20, 2012.

*Defense Logistics: Department of Defense Has Enhanced Prepositioned Stock Management but Should Provide More Detailed Status Reports*. [GAO-11-852R](#). Washington, D.C.; September 30, 2011.

*Warfighter Support: Improved Joint Oversight and Reporting on DOD's Prepositioning Programs May Increase Efficiencies*. [GAO-11-647](#). Washington, D.C.: May 16, 2011.

*Defense Logistics: Department of Defense's Annual Report on the Status of Prepositioned Materiel and Equipment Can Be Further Enhanced to Better Inform Congress*. [GAO-10-172R](#). Washington, D.C.: November 4, 2009.

*Defense Logistics: Department of Defense's Annual Report on the Status of Prepositioned Materiel and Equipment Can Be Enhanced to Better Inform Congress*. [GAO-09-147R](#). Washington, D.C.: December 15, 2008.

*Defense Logistics: Improved Oversight and Increased Coordination Needed to Ensure Viability of the Army's Prepositioning Strategy*. [GAO-07-144](#). Washington, D.C.: February 15, 2007.

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